**PROJECT TITLE**: Evaluation of regional spring wheat, durum, and oat yield trials - 2004

**PROJECT LEADER**:
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**PROJECT PERSONNEL**:
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**OBJECTIVE**: To evaluate new and introduced lines and cultivars of spring wheat, durum, and oats developed by Universities, the USDA-ARS, and private seed companies, and to determine adaptability of those lines and varieties to conditions in eastern Montana.

**MATERIALS AND METHODS:**

**Dryland site:**

Soil type: Williams clay loam
Previous crops: 2003 - fallow, 2002 - safflower. 2001 - small grain plots
Residual soil N to 3 ft: 121 lb N/ac
Residual soil P to 6 in: 27 ppm
Residual soil K to 6 in: 282 ppm
Applied fertilizer: None
Herbicides: 2 pt/ac Bronate applied May 28

**Irrigated site:**

Precipitation April – August, 2004: 10.01 inches
Ave (56 yr) precipitation April – August: 9.44 inches
Precipitation September 2003 – August 2004: 13.50 inches
Ave (56 yr) precipitation September – August: 13.83 inches

Soil type: Savage silty clay
Previous crops: 2003 - safflower, 2002 - sugarbeets, 2001 – barley
Residual soil N to 3 ft: 80 lb N/ac
Residual soil P to 6 in: 27 ppm
Residual soil K to 6 in: 316 ppm
Applied fertilizer: 200 lb 18-46-0 applied October 28, 2003
Irrigated (sprinkler) on: May 4, May 17, Jun 21
Herbicides: 1.75 pt/ac Bronate applied Jun 8
Fungicide: 20 Oz/ac Tilt and 3 oz/ac Folicure applied Jun 24

Precipitation April – August, 2004: 6.45 inches
Ave (56 yr) precipitation April – August: 9.44 inches
Precipitation September 2003 – August 2004: 10.79 inches
Ave (56 yr) precipitation September – August: 13.83 inches

Comments:
Good soil moisture at planting, but winds from early March to the end of May dried the soil quickly. Grain planted into moisture did well, grain planted into dry soil did not emerge until irrigated. Summer was cooler than average.

Planting and harvest dates in 2004 were:

| Nursery | Planting date | Harvest date |
|---|---|---|
| Uniform Regional Hard Red Spring Wheat Trial | Apr 12 | Aug 16 |
| Uniform Regional Durum Trial – dryland | Apr 9 | Aug 12 |
| Uniform Regional Durum Trial – irrigated | Apr 21 | Aug 20 |
| Uniform Regional Oat Trial | Apr 8 | Aug 12Apr 8 Aug 12 |

**RESULTS:**

**Uniform Regional Hard Red Spring Wheat trial:** The Uniform Regional Hard Red Spring wheat trial is conducted in cooperation with Dr. G. Linkert of the University of Minnesota, St. Paul. Dr. G. Hareland of North Dakota State University, Fargo, tests quality of each line and variety. Forty experimental lines and varieties of spring wheat were tested under dryland conditions (Table 1). Four experimental lines and varieties yielded significantly more than the check variety, Verde, and four yielded significantly less. Average yield was 59.5 bu/acre. Five-year summaries for yield, test weight, and protein are shown in Tables 2 through 4.

**Uniform Regional Durum trial, dryland:** The Uniform Regional Durum trial is conducted in cooperation with Dr. E.M. Elias, North Dakota State University, Fargo. Dr. G. Hareland of North Dakota State University, Fargo, tests quality of each line and variety. Twenty-four experimental lines and varieties were tested under dryland fallow conditions (Table 5). No lines or varieties significantly out yielded the check variety, Mountrail and 12 yielded significantly less. Average yield was 54.8 bu/acre. Five-year summaries for yield, test weight, and protein are shown in Tables 6 through 8.

**Uniform Regional Durum trial, dryland:** The Uniform Regional Durum trial is conducted in cooperation with Dr. E.M. Elias, North Dakota State University, Fargo. Dr. G. Hareland of North Dakota State University, Fargo, tests quality of each line and variety. Twenty-four experimental lines and varieties were tested under sprinkle irrigated conditions (Table 9). Two lines or varieties yielded significantly more than the check variety Mountrail, and one yielded significantly less. Average yield was 81.2 bu/acre. Five-year summaries for yield, test weight, protein content and lodging of durum varieties grown under irrigation are shown in Tables 10 through 13.

**Uniform Regional Oat trial**: The Uniform Regional Oat trial is conducted in cooperation with Dr. C. Erickson of the USDA-ARS National Small Grain Facility, Aberdeen, ID. Thirty-two experimental lines and varieties were tested (Table 14). Twelve lines yielded significantly more the check variety, Otana and one yielded significantly less. Average yield was 144.4 bu/acre. Five-year summaries for yield, test weight, and protein are shown in Tables 15 through 17.

**SUMMARY**: The uniform regional yield trials are conducted at many sites in several states across the western USA, and have been in place since the 1930's. These trials provide important information about experimental lines from state breeding programs, private companies, and the USDA-ARS breeding programs. New varieties are released based on data from these trials.

**FUTURE PLANS**: New and existing varieties and experimental lines of spring wheat, durum and oat will continue to be tested under dryland and irrigated conditions at the Eastern Agricultural Research Center, so that breeders can release improved varieties and producers can have information on varieties that are adapted to this area. A durum selection and breeding program has been established at EARC in cooperation with the durum breeder from NDSU for development of new varieties adapted to irrigated and dryland conditions in eastern Montana and western North Dakota. New and existing varieties and experimental lines of winter wheat are now being tested under dryland conditions at the Williston Research Center in cooperation with the winter wheat breeder from MSU.

Table 1. Agronomic data obtained from a Uniform Regional hard red spring wheat yield trial grown under dryland fallow conditions at the Eastern Agricultural Research Center, Sidney, MT.

| Line or variety | Heading* | Height, cm | Grain protein | Test weight, lb/bu | Yield, bu/ac | |
|---|---|---|---|---|---|---|
| 98S01270 | 69.7 | 70.7 | 13.58 | 62.5 | 72.7 | a |
| MT 0245 | 72.7 | 78.7 | 15.38 | 61.3 | 72.5 | a |
| WA007931 | 69.7 | 84.7 | 13.51 | 62.0 | 72.1 | a |
| MT 0249 | 69.7 | 75.0 | 15.02 | 61.7 | 69.9 | a |
| SD 3746 | 71.3 | 74.3 | 13.17 | 60.3 | 68.6 | a |
| SD 3747 | 67.0 | 74.0 | 13.56 | 60.8 | 67.1 | |
| BZ998447 | 69.3 | 83.3 | 12.78 | 60.5 | 67.0 | |
| SD 3618 | 69.7 | 86.7 | 14.91 | 61.3 | 66.6 | |
| 2375 | 70.0 | 83.7 | 14.58 | 61.7 | 66.6 | |
| 98S00511 | 71.0 | 76.3 | 14.55 | 61.7 | 64.2 | |
| ND 800 | 72.7 | 85.7 | 15.10 | 62.0 | 64.2 | |
| NDSW0347 | 72.3 | 83.0 | 16.61 | 61.5 | 64.1 | |
| MN01311A | 70.7 | 85.7 | 15.48 | 62.0 | 63.8 | |
| Keene | 71.3 | 96.0 | 15.76 | 62.0 | 62.5 | |
| SD 3635 | 70.7 | 90.0 | 14.26 | 60.8 | 62.5 | |
| WA007925 | 71.0 | 80.7 | 15.18 | 60.8 | 62.4 | |
| McNeal | 74.3 | 78.3 | 13.76 | 59.8 | 62.3 | |
| 96S04040 | 70.0 | 68.3 | 15.02 | 62.2 | 61.5 | |
| CA901580 | 68.3 | 93.0 | 15.80 | 62.0 | 60.4 | |
| ND 751 | 74.0 | 85.3 | 15.82 | 61.8 | 60.2 | |
| á97S0254 | 74.0 | 71.0 | 14.61 | 61.2 | 60.2 | |
| SD 3668 | 67.3 | 91.7 | 15.12 | 62.2 | 60.0 | |
| ND 741 | 71.3 | 80.0 | 15.75 | 61.5 | 59.7 | |
| MN994366 | 68.7 | 76.0 | 15.18 | 61.8 | 59.2 | |
| SD 3687 | 70.3 | 82.3 | 14.86 | 59.0 | 59.1 | |
| NDSW0345 | 75.7 | 89.7 | 15.92 | 61.2 | 59.1 | |
| Verde | 73.3 | 74.0 | 14.35 | 61.0 | 57.8 | |
| ES63 | 74.3 | 83.7 | 15.09 | 58.7 | 57.6 | |
| BW341 | 71.7 | 87.7 | 15.76 | 61.3 | 57.4 | |
| NDSW0217 | 70.7 | 87.7 | 13.30 | 59.8 | 56.2 | |
| ND 747 | 69.0 | 88.3 | 16.92 | 63.3 | 55.4 | |
| ND 801 | 71.0 | 85.7 | 17.05 | 61.7 | 53.9 | |
| N990241 | 75.0 | 75.7 | 14.88 | 61.0 | 53.6 | |
| MN002614 | 74.0 | 76.7 | 14.76 | 61.7 | 53.1 | |
| MN01333A | 70.0 | 72.0 | 14.92 | 61.2 | 49.1 | |
| CA902701 | 68.7 | 76.7 | 17.27 | 62.7 | 48.1 | |
| BW346 | 72.7 | 89.7 | 16.47 | 59.5 | 45.0 | x |
| Chris | 74.3 | 92.0 | 15.97 | 58.8 | 44.1 | x |
| Marquis | 77.0 | 104.3 | 16.28 | 59.2 | 40.8 | x |
| MN01197 | 77.3 | 78.3 | 15.17 | 57.7 | 40.7 | x |
| Average | 71.5 | 82.4 | 15.09 | 61.1 | 59.5 | |
| Probability | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | |
| CV (S/Mean) % | 1.8 | 5.6 | 4.3 | 1.2 | 10.7 | |
| LSD (0.05) | 2.0 | 7.5 | 1.04 | 1.2 | 10.3 | |

*days from planting

a indicates significantly greater yield than check variety, Verde, at a probability of 0.05

x indicates significantly lower yield than check variety, Verde, at a probability of 0.05

Table 2. Relative yields of spring wheat varieties as compared to Chris when grown under dryland fallow conditions in the Uniform Regional Hard Red Spring Wheat trial at Sidney, MT.

| Cultivar | 2000 | 2001 | 2002 | 2003 | 2004 | Ave | as % of Verde |
|---|---|---|---|---|---|---|---|
| MT0245 | -- | -- | -- | -- | 72.5 | 72.5 | 125.4 |
| MT0249 | -- | -- | -- | -- | 69.9 | 69.9 | 120.9 |
| BZ998447 | -- | -- | -- | 61.3 | 67.0 | 64.2 | 115.6 |
| NDSW0347 | -- | -- | -- | -- | 64.1 | 64.1 | 110.9 |
| ND 800 | -- | -- | -- | 58.5 | 64.2 | 61.4 | 110.5 |
| McNeal | -- | -- | -- | -- | 62.3 | 62.3 | 107.8 |
| Outlook | -- | 60.5 | 43.4 | -- | -- | 52.0 | 106.9 |
| ND751 | -- | -- | -- | 57.9 | 60.2 | 59.1 | 106.4 |
| NDSW0345 | -- | -- | -- | -- | 59.1 | 59.1 | 102.2 |
| 2375 | 52.6 | 51.0 | 44.7 | 56.3 | 66.6 | 54.2 | 101.3 |
| Keene | 57.1 | 50.2 | 44.8 | 54.4 | 62.5 | 53.8 | 100.5 |
| Verde | 59.5 | 51.3 | 45.9 | 53.2 | 57.8 | 53.5 | 100.0 |
| Steele (ND741) | -- | 50.5 | 45.5 | 52.5 | 59.7 | 52.1 | 100.0 |
| ND801 | -- | -- | -- | 55.3 | 53.9 | 54.6 | 98.4 |
| ND747 | -- | -- | -- | 53.4 | 55.4 | 54.4 | 98.0 |
| NDSW0217 | -- | -- | -- | -- | 56.2 | 56.2 | 97.2 |
| Choteau | -- | -- | 37.7 | 47.9 | -- | 42.8 | 86.4 |
| Chris 525-1 | 52.7 | 43.0 | 33.9 | 41.8 | 44.1 | 43.1 | 80.5 |
| Marquis | 45.5 | 46.7 | 29.8 | 43.4 | 40.8 | 41.2 | 77.0 |

NOTE: Average yields in this summary should not be compared to each other since they are not grown in the same years. Compare yields only to the check variety.

Table 3. Relative test weights of spring wheat varieties as compared to Chris when grown under dryland fallow conditions in the Uniform Regional Hard Red Spring Wheat trial at Sidney, MT.

| Cultivar | 2000 | 2001 | 2002 | 2003 | 2004 | Ave | as % of Verde |
|---|---|---|---|---|---|---|---|
| ND747 | -- | -- | -- | 64.0 | 63.3 | 63.7 | 103.7 |
| Keene | 62.5 | 62.2 | 60.5 | 62.7 | 62.0 | 62.0 | 102.1 |
| ND 800 | -- | -- | -- | 63.0 | 62.0 | 62.5 | 101.9 |
| ND751 | -- | -- | -- | 63.0 | 61.8 | 62.4 | 101.7 |
| ND801 | -- | -- | -- | 63.0 | 61.7 | 62.4 | 101.6 |
| MT0249 | -- | -- | -- | -- | 61.7 | 61.7 | 101.1 |
| NDSW0347 | -- | -- | -- | -- | 61.5 | 61.5 | 100.8 |
| Steele (ND741) | -- | 61.7 | 58.5 | 61.5 | 61.5 | 60.8 | 100.7 |
| 2375 | 62.8 | 60.7 | 58.8 | 61.3 | 61.7 | 61.1 | 100.6 |
| MT0245 | -- | -- | -- | -- | 61.3 | 61.3 | 100.5 |
| NDSW0345 | -- | -- | -- | -- | 61.2 | 61.2 | 100.3 |
| Choteau | -- | -- | 57.7 | 62.5 | -- | 60.1 | 100.3 |
| Verde | 62.2 | 60.5 | 58.2 | 61.7 | 61.0 | 60.7 | 100.0 |
| Marquis | 62.5 | 60.5 | 58.7 | 62.0 | 59.2 | 60.6 | 99.8 |
| Outlook | -- | 59.7 | 57.7 | -- | -- | 58.7 | 98.9 |
| Chris 525-1 | 62.7 | 59.8 | 57.0 | 60.2 | 58.8 | 59.7 | 98.3 |
| BZ998447 | -- | -- | -- | 59.8 | 60.5 | 60.2 | 98.0 |
| NDSW0217 | -- | -- | -- | -- | 59.8 | 59.8 | 98.0 |
| McNeal | -- | -- | -- | -- | 59.8 | 59.8 | 98.0 |

NOTE: Average test weights in this summary should not be compared to each other since they are not grown in the same years. Compare test weights only to the check variety.

Table 4. Relative protein contents of spring wheat varieties as compared to Chris when grown under dryland fallow conditions in the Uniform Regional Hard Red Spring Wheat trial at Sidney, MT.

| Cultivar | 2000 | 2001 | 2002 | 2003 | 2004 | Ave | as % of Verde |
|---|---|---|---|---|---|---|---|
| NDSW0347 | -- | -- | -- | -- | 16.6 | 16.6 | 115.3 |
| ND747 | -- | -- | -- | 15.0 | 16.9 | 16.0 | 112.7 |
| Marquis | 13.1 | 13.3 | 15.0 | 15.3 | 16.3 | 14.6 | 111.1 |
| NDSW0345 | -- | -- | -- | -- | 15.9 | 15.9 | 110.4 |
| ND801 | -- | -- | -- | 14.0 | 17.0 | 15.5 | 109.5 |
| Keene | 13.9 | 13.0 | 13.8 | 15.1 | 15.8 | 14.3 | 109.0 |
| Chris 525-1 | 12.9 | 13.3 | 14.3 | 15.0 | 16.0 | 14.3 | 108.8 |
| MT0245 | -- | -- | -- | -- | 15.4 | 15.4 | 106.9 |
| Steele (ND741) | -- | 13.8 | 13.2 | 13.5 | 15.8 | 14.1 | 105.0 |
| MT0249 | -- | -- | -- | -- | 15.0 | 15.0 | 104.2 |
| ND751 | -- | -- | -- | 13.2 | 15.8 | 14.5 | 102.5 |
| Outlook | -- | 12.8 | 13.1 | -- | -- | 13.0 | 102.4 |
| ND 800 | -- | -- | -- | 13.7 | 15.1 | 14.4 | 101.8 |
| Verde | 12.1 | 12.1 | 13.2 | 13.9 | 14.4 | 13.1 | 100.0 |
| 2375 | 12.1 | 12.2 | 13.0 | 13.6 | 14.6 | 13.1 | 99.7 |
| Choteau | -- | -- | 13.0 | 13.5 | -- | 13.3 | 97.8 |
| McNeal | | | | | 13.8 | 13.8 | 95.8 |
| NDSW0217 | -- | -- | -- | -- | 13.3 | 13.3 | 92.4 |
| BZ998447 | | | | 12.1 | 12.8 | 12.5 | 88.0 |

NOTE: Average protein contents in this summary should not be compared to each other since they are not grown in the same years. Compare protein contents only to the check variety.

Table 5. Agronomic data obtained from a Uniform Regional durum yield trial grown under dryland fallow conditions at the Eastern Agricultural Research Center, Sidney, MT

| Line of variety | Heading* | Height, cm | Hard vitreous amber color | grain protein | test weight, lb/bu | Yield, bu/ac | |
|---|---|---|---|---|---|---|---|
| AC AVONLEA | 73.3 | 92.7 | 93.7 | 13.91 | 61.0 | 61.0 | |
| D99073 | 75.0 | 74.0 | 83.3 | 13.07 | 60.8 | 60.7 | |
| MOUNTRAIL | 76.0 | 89.7 | 93.1 | 13.42 | 61.2 | 60.7 | |
| PLAZA | 76.0 | 73.0 | 88.3 | 13.25 | 60.8 | 59.7 | |
| MAIER | 74.7 | 83.3 | 96.3 | 13.91 | 61.3 | 58.2 | |
| D96604 | 75.0 | 84.0 | 96.4 | 12.52 | 61.7 | 57.9 | |
| D97780 | 74.3 | 82.0 | 94.3 | 13.57 | 61.7 | 57.1 | |
| D99983 | 75.3 | 88.0 | 88.4 | 13.09 | 60.7 | 56.9 | |
| D971511 | 75.3 | 86.7 | 88.5 | 13.81 | 60.8 | 55.9 | |
| RENVILLE | 75.0 | 93.7 | 94.3 | 13.24 | 61.7 | 55.7 | |
| D99637 | 75.7 | 90.0 | 85.3 | 13.74 | 61.3 | 54.9 | |
| PIERCE | 74.3 | 85.7 | 86.8 | 13.72 | 61.8 | 54.8 | |
| D97643 | 74.7 | 84.7 | 59.5 | 11.84 | 60.7 | 54.2 | x |
| D99938 | 75.7 | 89.3 | 87.2 | 14.75 | 60.3 | 53.4 | x |
| BEN | 73.3 | 91.3 | 89.5 | 15.03 | 61.0 | 53.3 | x |
| DILSE | 75.3 | 85.0 | 93.5 | 14.23 | 61.0 | 53.0 | x |
| D99656 | 74.3 | 85.7 | 85.1 | 13.63 | 61.0 | 53.0 | x |
| D98529 | 74.7 | 83.0 | 92.9 | 13.87 | 61.5 | 52.9 | x |
| D99891 | 74.7 | 89.3 | 91.7 | 13.79 | 60.7 | 52.7 | x |
| D95097 | 73.0 | 85.3 | 91.5 | 13.70 | 60.7 | 52.2 | x |
| DGO14152 | 72.0 | 81.0 | 91.7 | 13.97 | 62.3 | 52.1 | x |
| D99541 | 73.7 | 85.3 | 91.8 | 13.70 | 60.5 | 51.6 | x |
| D98530 | 73.0 | 81.0 | 95.3 | 13.94 | 61.2 | 47.5 | x |
| LEBSOCK | 74.7 | 81.0 | 91.8 | 14.51 | 61.0 | 45.6 | x |
| Average | 74.5 | 85.2 | 89.6 | 13.67 | 61.1 | 54.8 | |
| Probability | <0.001 | <0.001 | 0.003 | <0.001 | <0.001 | <0.001 | |
| CV (S/Mean) % | 1.1 | 3.4 | 8.9 | 3.9 | 0.7 | 6.9 | |
| CV (SE/Mean)% | 0.6 | 2.0 | 5.1 | 2.3 | 0.4 | 4.0 | |
| LSD (0.05) | 1.3 | 4.8 | 13.1 | 0.88 | 0.7 | 6.2 | |

* days from planting

x indicates significantly lower yield than check variety, Mountrail, at a probability of 0.05

Table 6. Relative yields of durum varieties as compared to Renville when grown in the Uniform Regional Durum trial under dryland fallow conditions at the EARC, Sidney, Montana.

| Cultivar | 2000 | 2001 | 2002 | 2003 | 2004 | Ave | as % of Mountrail |
|---|---|---|---|---|---|---|---|
| Plaza | 56.7 | 54.7 | 36.9 | 54.6 | 59.7 | 52.5 | 100.5 |
| Mountrail | 50.8 | 55.8 | 37.1 | 56.8 | 60.7 | 52.2 | 100.0 |
| Pierce | 52.8 | 53.6 | 39.5 | 53.1 | 54.8 | 50.8 | 97.2 |
| AC Avonlea | 52.3 | 50.8 | 34.7 | 54.8 | 61.0 | 50.7 | 97.1 |
| Maier | 52.7 | 48.1 | 38.7 | 54.3 | 58.2 | 50.4 | 96.5 |
| Renville | 51.5 | 51.6 | 38.6 | 52.7 | 55.7 | 50.0 | 95.8 |
| Ben | 50.9 | 51.4 | 38.8 | 53.3 | 53.3 | 49.5 | 94.8 |
| Dilse | 50.5 | 47.8 | 39.4 | 52.6 | 53.0 | 48.7 | 93.1 |
| Lebsock | 48.3 | 47.0 | 40.6 | 53.6 | 45.6 | 47.0 | 90.0 |

NOTE: Average yields in this summary should not be compared to each other since they are not grown in the same years. Compare yields only to the check variety.

Table 7. Relative test weights of durum varieties as compared to Renville when grown in the Uniform Regional Durum trial under dryland fallow conditions at the EARC, Sidney, Montana.

| Cultivar | 2000 | 2001 | 2002 | 2003 | 2004 | Ave | as % of Mountrail |
|---|---|---|---|---|---|---|---|
| Lebsock | 63.3 | 62.5 | 60.7 | 62.5 | 61.0 | 62.0 | 102.1 |
| Pierce | 63.0 | 62.0 | 60.2 | 62.0 | 61.8 | 61.8 | 101.8 |
| Ben | 62.8 | 62.0 | 59.7 | 63.3 | 61.0 | 61.8 | 101.7 |
| Maier | 62.5 | 60.8 | 59.8 | 63.0 | 61.3 | 61.5 | 101.3 |
| Dilse | 62.5 | 61.7 | 59.5 | 62.5 | 61.0 | 61.4 | 101.2 |
| Renville | 61.2 | 61.2 | 59.3 | 61.8 | 61.7 | 61.0 | 100.6 |
| AC Avonlea | 61.8 | 61.3 | 58.7 | 61.5 | 61.0 | 60.9 | 100.3 |
| Plaza | 62.7 | 60.5 | 58.3 | 61.7 | 60.8 | 60.8 | 100.2 |
| Mountrail | 62.2 | 61.0 | 57.8 | 61.3 | 61.2 | 60.7 | 100.0 |

NOTE: Average test weights in this summary should not be compared to each other since they are not grown in the same years. Compare test weights only to the check variety.

Table 8. Relative protein contents of durum varieties as compared to Renville when grown in the Uniform Regional Durum trial under dryland fallow conditions at the EARC, Sidney, Montana

| Cultivar | 2000 | 2001 | 2002 | 2003 | 2004 | Ave | as % of Mountrail |
|---|---|---|---|---|---|---|---|
| AC Avonlea | 13.3 | 13.7 | 15.1 | 15.2 | 13.9 | 14.2 | 105.8 |
| Dilse | 13.3 | 13.5 | 15.1 | 14.6 | 14.2 | 14.1 | 105.1 |
| Renville | 13.4 | 13.8 | 14.8 | 14.6 | 13.2 | 14.0 | 103.7 |
| Ben | 13.2 | 13.3 | 14.4 | 13.8 | 15.0 | 13.9 | 103.6 |
| Lebsock | 13.5 | 12.8 | 14.0 | 14.4 | 14.5 | 13.8 | 102.8 |
| Maier | 13.2 | 13.4 | 14.5 | 13.9 | 13.9 | 13.8 | 102.4 |
| Pierce | 12.8 | 12.9 | 14.4 | 14.8 | 13.7 | 13.7 | 101.9 |
| Mountrail | 12.4 | 12.4 | 14.9 | 14.2 | 13.4 | 13.5 | 100.0 |
| Plaza | 12.3 | 12.8 | 14.6 | 13.8 | 13.2 | 13.3 | 99.1 |

NOTE: Average protein contents in this summary should not be compared to each other since they are not grown in the same years. Compare only to the check variety.

Table 9. Agronomic data obtained from a Uniform Regional durum yield trial grown under sprinkle irrigated conditions at the Eastern Agricultural Research Center, Sidney, MT.

| Line or variety | Heading* | Height, cm | Lodging index | Hard vitreous amber color | grain protein | test wt, lb/bu | Yield, bu/ac | |
|---|---|---|---|---|---|---|---|---|
| D99073 | 69.3 | 80.7 | 0.0 | 95.3 | 10.89 | 63.7 | 108.9 | a |
| PLAZA | 70.3 | 76.3 | 0.0 | 102.0 | 11.31 | 63.8 | 96.6 | a |
| RENVILLE | 68.7 | 104.0 | 0.7 | 85.8 | 11.57 | 63.7 | 91.5 | |
| D99983 | 67.7 | 93.3 | 0.3 | 89.3 | 10.76 | 63.7 | 90.4 | |
| D97780 | 68.3 | 89.7 | 0.0 | 107.7 | 12.28 | 63.7 | 86.8 | |
| D98529 | 67.0 | 83.0 | 0.0 | 109.2 | 12.44 | 64.0 | 85.2 | |
| D97643 | 69.7 | 87.3 | 0.0 | 80.7 | 10.99 | 63.3 | 84.6 | |
| D96604 | 68.0 | 85.3 | 0.0 | 103.1 | 11.46 | 63.8 | 84.2 | |
| D98530 | 66.3 | 87.7 | 0.0 | 111.3 | 12.57 | 63.7 | 83.0 | |
| D99938 | 67.3 | 89.3 | 0.0 | 100.9 | 12.22 | 63.5 | 81.6 | |
| D99637 | 69.0 | 94.0 | 0.0 | 100.1 | 12.87 | 63.7 | 81.6 | |
| DGO14152 | 65.3 | 86.0 | 0.3 | 113.5 | 13.48 | 64.7 | 81.1 | |
| D99541 | 69.0 | 84.7 | 0.0 | 98.7 | 12.05 | 63.2 | 80.5 | |
| Mountrail | 69.3 | 80.0 | 0.0 | 106.4 | 12.97 | 62.8 | 79.4 | |
| AC Avonlea | 66.3 | 92.7 | 0.0 | 106.2 | 13.20 | 63.2 | 78.8 | |
| MAIER | 68.7 | 79.7 | 0.0 | 110.5 | 12.97 | 63.8 | 78.6 | |
| DILSE | 69.0 | 85.3 | 0.0 | 107.3 | 14.18 | 63.0 | 77.9 | |
| D99656 | 69.0 | 89.3 | 0.3 | 100.4 | 11.85 | 63.8 | 77.8 | |
| D95097 | 66.3 | 86.7 | 0.0 | 104.5 | 12.34 | 63.3 | 76.7 | |
| Ben | 67.0 | 95.7 | 1.0 | 100.8 | 12.99 | 63.8 | 73.4 | |
| D971511 | 68.3 | 93.0 | 0.3 | 107.2 | 13.45 | 62.8 | 68.8 | |
| Lebsock | 67.0 | 77.7 | 0.0 | 109.0 | 13.20 | 63.5 | 68.4 | |
| D99891 | 66.0 | 92.0 | 0.0 | 109.3 | 13.63 | 63.2 | 67.5 | |
| Pierce | 67.7 | 86.0 | 0.0 | 105.5 | 12.83 | 63.2 | 65.5 | x |
| Average | 67.9 | 87.5 | 0.1 | 102.7 | 12.44 | 63.5 | 81.2 | |
| Probability | 0.001 | 0.011 | 0.001 | 0.380 | 0.004 | 0.006 | <0.001 | |
| CV (S/Mean) % | 2.0 | 8.5 | 207.1 | 13.1 | 8.3 | 0.7 | 9.2 | |
| CV (SE/Mean)% | 1.2 | 4.9 | 119.6 | 7.6 | 4.8 | 0.4 | 5.3 | |
| LSD (0.05) | 2.2 | 12.3 | 0.4 | 22.1 | 1.69 | 0.8 | 12.3 | |

*days from planting

x indicates significantly lower yield than check variety, Mountrail, at a probability of 0.05

Table 10. Relative yields of durum varieties compared to Renville when grown in the irrigated Uniform Regional Durum Trial at the EARC, Sidney, Montana.

| Cultivar | 2000 | 2001 | 2002 | 2003 | 2004 | Ave | as % of Mountrail |
|---|---|---|---|---|---|---|---|
| Plaza | 94.6 | 57.2 | 72.4 | 117.0 | 96.6 | 87.6 | 102.2 |
| Mountrail | 103.2 | 48.0 | 73.3 | 124.3 | 79.4 | 85.6 | 100.0 |
| Dilse | 94.0 | 53.7 | 67.5 | 112.8 | 77.9 | 81.2 | 94.8 |
| Maier | 93.9 | 46.6 | 66.7 | 118.9 | 78.6 | 80.9 | 94.5 |
| Lebsock | 94.5 | 54.5 | 66.3 | 110.8 | 68.4 | 78.9 | 92.1 |
| Ben | 96.2 | 50.6 | 65.3 | 107.5 | 73.4 | 78.6 | 91.8 |
| Renville | 85.9 | 34.3 | 68.3 | 109.3 | 91.5 | 77.9 | 90.9 |
| Pierce | 94.3 | 32.8 | 71.6 | 116.1 | 65.5 | 76.1 | 88.8 |
| AC Avonlea | 94.9 | 27.7 | 64.4 | 112.7 | 78.8 | 75.7 | 88.4 |

NOTE: Average yields in this summary should not be compared to each other since they are not grown in the same years. Compare yields only to the check variety.

Table 11. Relative test weights of durum varieties compared to Renville when grown in the irrigated Uniform Regional Durum Trial at the EARC, Sidney, Montana.

| Cultivar | 2000 | 2001 | 2002 | 2003 | 2004 | Ave | as % of Mountrail |
|---|---|---|---|---|---|---|---|
| Lebsock | 64.0 | 58.8 | 63.5 | 64.3 | 63.5 | 62.8 | 101.8 |
| Ben | 63.3 | 58.3 | 63.2 | 64.5 | 63.8 | 62.6 | 101.5 |
| Pierce | 63.2 | 57.1 | 64.0 | 64.3 | 63.2 | 62.4 | 101.1 |
| Maier | 62.8 | 57.2 | 63.3 | 64.0 | 63.8 | 62.2 | 100.9 |
| Dilse | 62.8 | 57.7 | 62.3 | 63.8 | 63.0 | 61.9 | 100.4 |
| Plaza | 62.8 | 56.7 | 62.7 | 63.3 | 63.8 | 61.9 | 100.3 |
| Renville | 62.7 | 55.8 | 63.2 | 63.7 | 63.7 | 61.8 | 100.2 |
| Mountrail | 63.0 | 55.7 | 63.2 | 63.7 | 62.8 | 61.7 | 100.0 |
| AC Avonlea | 62.3 | 52.4 | 62.0 | 62.7 | 63.2 | 60.5 | 98.1 |

NOTE: Average test weights in this summary should not be compared to each other since they are not grown in the same years. Compare yields only to the check variety.

Table 12. Relative protein contents of durum varieties compared to Renville when grown in the irrigated Uniform Regional Durum Trial at the EARC, Sidney, Montana.

| Cultivar | 2000 | 2001 | 2002 | 2003 | 2004 | Ave | as % of Mountrail |
|---|---|---|---|---|---|---|---|
| Dilse | 13.2 | 16.2 | 11.5 | 15.1 | 14.2 | 14.0 | 106.7 |
| AC Avonlea | 12.9 | 17.2 | 12.3 | 14.3 | 13.2 | 14.0 | 106.2 |
| Maier | 12.8 | 15.9 | 12.3 | 14.2 | 13.0 | 13.6 | 103.6 |
| Ben | 13.0 | 15.4 | 12.0 | 14.3 | 13.0 | 13.5 | 102.9 |
| Renville | 13.4 | 15.9 | 11.4 | 14.2 | 11.6 | 13.3 | 101.1 |
| Pierce | 12.2 | 15.8 | 11.4 | 14.0 | 12.8 | 13.2 | 100.6 |
| Lebsock | 12.5 | 15.2 | 11.5 | 13.7 | 13.2 | 13.2 | 100.5 |
| Mountrail | 11.8 | 15.8 | 11.6 | 13.6 | 13.0 | 13.2 | 100.0 |
| Plaza | 11.4 | 15.1 | 11.8 | 13.1 | 11.3 | 12.5 | 95.3 |

NOTE: Average protein contents in this summary should not be compared to each other since they are not grown in the same years. Compare yields only to the check variety.

Table 13. Relative lodging indices of durum varieties compared to Renville when grown in the irrigated Uniform Regional Durum Trial at the EARC, Sidney, Montana.

| Cultivar | 2000 | 2001 | 2002 | 2003 | 2004 | Ave | as % of Mountrail |
|---|---|---|---|---|---|---|---|
| Renville | 0.0 | 8.7 | 1.3 | 3.0 | 0.7 | 2.7 | 129.2 |
| Pierce | 0.0 | 8.3 | 1.0 | 3.0 | 0.0 | 2.5 | 116.0 |
| Ben | 0.0 | 7.3 | 0.7 | 2.7 | 1.0 | 2.3 | 110.4 |
| Mountrail | 0.0 | 8.0 | 1.3 | 1.3 | 0.0 | 2.1 | 100.0 |
| Maier | 0.0 | 7.7 | 0.3 | 2.0 | 0.0 | 2.0 | 94.3 |
| Dilse | 0.0 | 6.7 | 0.7 | 2.3 | 0.0 | 1.9 | 91.5 |
| AC Avonlea | 0.0 | 7.7 | 0.3 | 1.3 | 0.0 | 1.9 | 87.7 |
| Lebsock | 0.0 | 7.3 | 0.3 | 1.7 | 0.0 | 1.9 | 87.7 |
| Plaza | 0.0 | 3.7 | 0.0 | 0.7 | 0.0 | 0.9 | 41.5 |

NOTE: Average lodging indices in this summary should not be compared to each other since they are not grown in the same years. Compare yields only to the check variety.

Table 14. Agronomic data obtained from a uniform regional oat yield trial grown under dryland fallow conditions at the Eastern Agricultural Research Center, Sidney, MT.

| Line of variety | Heading* | Height, cm | Grain protein | Test wt, lb/bu | Yield, bu/ac | |
|---|---|---|---|---|---|---|
| 96AB8597 | 78.0 | 76.7 | 11.74 | 35.8 | 160.5 | a |
| 87AB5632 | 75.3 | 78.0 | 12.11 | 34.3 | 155.3 | a |
| 96AB8796 | 76.3 | 70.0 | 12.82 | 32.0 | 154.2 | a |
| Rio Grande | 72.0 | 73.0 | 13.20 | 33.0 | 153.9 | a |
| ABSP 9-2 | 74.0 | 77.7 | 13.05 | 35.7 | 153.7 | a |
| OT382 | 77.0 | 90.7 | 13.04 | 35.8 | 152.5 | a |
| 91AB502 | 69.0 | 70.0 | 13.56 | 33.7 | 150.1 | a |
| ABSP14-6 | 74.0 | 77.3 | 12.66 | 34.7 | 149.8 | a |
| CDC Pacer | 75.3 | 86.0 | 12.50 | 36.5 | 148.4 | a |
| 95A10854 | 79.7 | 75.0 | 12.72 | 35.7 | 148.1 | a |
| Monida | 79.0 | 86.7 | 12.77 | 33.5 | 147.7 | a |
| ABSP19-9 | 78.7 | 76.3 | 12.64 | 35.0 | 147.6 | a |
| Maverick | 76.0 | 64.0 | 12.79 | 33.7 | 146.9 | |
| Killdeer | 74.0 | 77.0 | 12.19 | 36.0 | 146.9 | |
| Powell | 77.3 | 67.7 | 12.79 | 32.0 | 146.7 | |
| 98AB6646 | 75.7 | 68.0 | 12.28 | 36.3 | 146.3 | |
| Celsia | 79.0 | 88.3 | 12.20 | 35.5 | 145.7 | |
| 98AB6491 | 75.3 | 68.7 | 11.95 | 35.8 | 144.4 | |
| 94AB5943 | 74.3 | 74.0 | 12.38 | 35.0 | 142.9 | |
| CDC Dancer | 76.0 | 90.7 | 12.43 | 36.2 | 142.5 | |
| 95A12584 | 72.7 | 77.0 | 12.89 | 34.3 | 141.2 | |
| Cayuse | 73.3 | 76.0 | 13.65 | 32.5 | 140.1 | |
| 97AB7571 | 75.0 | 79.0 | 13.29 | 35.7 | 140.1 | |
| 94AB5543 | 77.0 | 74.0 | 12.90 | 36.0 | 140.0 | |
| Derby | 76.7 | 94.0 | 12.54 | 36.7 | 138.6 | |
| 95A12661 | 76.7 | 69.3 | 12.95 | 34.5 | 137.7 | |
| Maverick, treated | 74.0 | 62.7 | 13.40 | 33.0 | 136.9 | |
| UC 128 | 69.3 | 71.3 | 12.21 | 32.8 | 136.0 | |
| Otana | 75.7 | 91.3 | 12.82 | 37.0 | 135.6 | |
| UC 129 | 69.0 | 72.0 | 12.23 | 33.7 | 133.5 | |
| Ajay | 74.3 | 59.0 | 14.11 | 33.5 | 132.7 | |
| UC 125 | 72.7 | 57.7 | 11.90 | 35.3 | 123.6 | x |
| Average | 75.1 | 75.6 | 12.71 | 34.7 | 144.4 | |
| Probability | <0.001 | <0.001 | 0.014 | <0.001 | <0.001 | |
| CV (S/Mean) % | 1.3 | 5.5 | 5.3 | 1.8 | 4.8 | |
| CV (SE/Mean)% | 0.7 | 3.1 | 3.1 | 1.0 | 2.8 | |
| LSD (0.05) | 1.6 | 6.7 | 1.10 | 1.0 | 11.4 | |

* days from planting

a indicates significantly greater yield than check variety, Otana, at a probability of 0.05

x indicates significantly lower yield than check variety, Otana, at a probability of 0.05

Table 15. Relative yields of oat varieties as compared to Otana when grown under dryland fallow conditions at the EARC, Sidney, Montana.

| Cultivar | 2000 | 2001 | 2002 | 2003 | 2004 | Ave | as % of Otana |
|---|---|---|---|---|---|---|---|
| ABSP 14-6 | -- | -- | 66.3 | 140.6 | 149.8 | 118.9 | 110.4 |
| ABSP 19-9 | 155.2 | 122.9 | 60.3 | 129.5 | 147.6 | 123.1 | 108.2 |
| Monico | 152.2 | 111.4 | 65.4 | 128.3 | 153.7 | 122.2 | 107.4 |
| Maverick | 149.7 | 116.5 | 69.5 | 122.2 | 146.9 | 121.0 | 106.3 |
| OT382 | -- | 122.0 | 38.2 | 136.2 | 152.5 | 112.2 | 105.5 |
| Celsia | 151.3 | 118.3 | 58.0 | 121.3 | 145.7 | 118.9 | 104.5 |
| Monida | 152.2 | 117.8 | 52.3 | 124.3 | 147.7 | 118.9 | 104.4 |
| CDC Pacer | 155.1 | 121.8 | 44.7 | 123.9 | 148.4 | 118.8 | 104.4 |
| Killdeer | 152.2 | 99.1 | 57.6 | 131.5 | 146.9 | 117.5 | 103.2 |
| Cayuse | 148.6 | 104.3 | 62.5 | 123.6 | 140.1 | 115.8 | 101.8 |
| Powell | 143.5 | 116.9 | 52.0 | 118.9 | 146.7 | 115.6 | 101.6 |
| UC 128 | -- | 96.2 | 65.2 | 130.0 | 136.0 | 106.9 | 100.4 |
| UC 129 | -- | 90.3 | 72.8 | 129.5 | 133.5 | 106.5 | 100.1 |
| Derby | 146.9 | 119.0 | 45.9 | 119.0 | 138.6 | 113.9 | 100.1 |
| Otana | 143.5 | 102.4 | 61.7 | 125.9 | 135.6 | 113.8 | 100.0 |
| Rio Grande | 134.0 | 95.4 | 70.0 | 114.1 | 153.9 | 113.5 | 99.7 |
| CDC Dancer | -- | 101.0 | 49.7 | 127.2 | 142.5 | 105.1 | 98.8 |
| Ajay | 126.8 | 90.2 | 58.2 | 104.3 | 132.7 | 102.4 | 90.0 |
| UC 125 | -- | 82.1 | 25.6 | 111.8 | 123.6 | 85.8 | 80.6 |

NOTE: Average yields in this summary should not be compared to each other since they are not grown in the same years. Compare yields only to the check variety.

Table 16. Relative test weights of oat varieties as compared to Otana when grown under dryland fallow conditions at the EARC, Sidney, Montana.

| Cultivar | 2000 | 2001 | 2002 | 2003 | 2004 | Ave | as % of Otana |
|---|---|---|---|---|---|---|---|
| CDC Pacer | 39.8 | 39.2 | 32.2 | 36.7 | 36.5 | 36.9 | 101.3 |
| CDC Dancer | -- | 37.8 | 32.7 | 37.5 | 36.2 | 36.1 | 101.0 |
| Derby | 40.3 | 38.5 | 30.8 | 37.2 | 36.7 | 36.7 | 100.8 |
| Killdeer | 39.2 | 36.8 | 32.8 | 38.3 | 36.0 | 36.6 | 100.5 |
| Monico (ABSP 9-2) | 40.5 | 37.7 | 31.3 | 37.0 | 35.7 | 36.4 | 100.1 |
| Otana | 39.3 | 37.5 | 31.5 | 36.8 | 37.0 | 36.4 | 100.0 |
| OT382 | -- | 38.0 | 31.0 | 37.7 | 35.8 | 35.6 | 99.8 |
| ABSP 19-9 | 38.8 | 37.7 | 30.8 | 35.2 | 35.0 | 35.5 | 97.5 |
| Celsia | 38.7 | 36.8 | 28.7 | 35.3 | 35.5 | 35.0 | 96.1 |
| UC 125 | -- | 35.3 | 30.0 | 35.8 | 35.3 | 34.1 | 95.5 |
| Maverick (90Ab1322) | 39.0 | 37.8 | 29.2 | 34.2 | 33.7 | 34.8 | 95.5 |
| UC 129 | -- | 35.5 | 30.3 | 36.7 | 33.7 | 34.1 | 95.4 |
| Monida | 38.3 | 38.0 | 29.7 | 32.8 | 33.5 | 34.5 | 94.6 |
| ABSP 14-6 | -- | -- | 29.7 | 34.8 | 34.7 | 33.1 | 94.2 |
| UC 128 | -- | 35.2 | 29.3 | 36.5 | 32.8 | 33.5 | 93.7 |
| Ajay | 38.0 | 36.3 | 27.5 | 35.3 | 33.5 | 34.1 | 93.7 |
| Rio Grande | 37.8 | 36.8 | 27.5 | 34.5 | 33.0 | 33.9 | 93.1 |
| Powell | 36.8 | 35.0 | 28.5 | 33.7 | 32.0 | 33.2 | 91.2 |
| Cayuse | 36.7 | 34.7 | 27.7 | 34.2 | 32.5 | 33.2 | 91.0 |

NOTE: Average test weights in this summary should not be compared to each other since they are not grown in the same years. Compare test weights only to the check variety.

Table 17. Relative protein contents of oat varieties as compared to Otana when grown under dryland fallow conditions at the EARC, Sidney, Montana.

| Cultivar | 2000 | 2001 | 2002 | 2003 | 2004 | Ave | as % of Otana |
|---|---|---|---|---|---|---|---|
| Ajay | 11.9 | 13.3 | 11.7 | 15.2 | 14.1 | 13.2 | 106.1 |
| Rio Grande | 11.9 | 13.2 | 11.0 | 14.6 | 13.2 | 12.8 | 102.4 |
| Cayuse | 11.0 | 11.5 | 11.2 | 15.2 | 13.6 | 12.5 | 100.2 |
| Otana | 11.7 | 12.8 | 11.2 | 13.9 | 12.8 | 12.5 | 100.0 |
| OT382 | -- | 11.7 | 12.9 | 13.0 | 13.0 | 12.7 | 99.8 |
| ABSP 19-9 | 10.4 | 11.6 | 13.3 | 14.3 | 12.6 | 12.4 | 99.7 |
| ABSP 14-6 | -- | -- | 11.3 | 13.7 | 12.7 | 12.6 | 99.5 |
| Maverick | 11.5 | 11.7 | 11.8 | 13.8 | 12.8 | 12.3 | 98.7 |
| Monico | 10.7 | 11.4 | 12.8 | 13.5 | 13.0 | 12.3 | 98.4 |
| CDC Pacer | 10.4 | 12.5 | 11.3 | 14.1 | 12.5 | 12.2 | 97.4 |
| Powell | 10.3 | 12.3 | 10.4 | 14.9 | 12.8 | 12.1 | 97.3 |
| UC 129 | -- | 11.6 | 10.8 | 14.3 | 12.2 | 12.2 | 96.4 |
| Killdeer | 10.0 | 11.6 | 12.0 | 13.9 | 12.2 | 11.9 | 95.7 |
| UC 128 | -- | 11.3 | 11.4 | 13.4 | 12.2 | 12.1 | 95.3 |
| Monida | 9.9 | 11.7 | 10.2 | 14.8 | 12.8 | 11.9 | 95.2 |
| CDC Dancer | -- | 11.0 | 10.6 | 13.7 | 12.4 | 11.9 | 94.1 |
| Celsia | 10.1 | 10.7 | 11.7 | 13.4 | 12.2 | 11.6 | 93.1 |
| Derby | 10.0 | 11.0 | 10.6 | 13.5 | 12.5 | 11.5 | 92.3 |
| UC 125 | -- | 9.7 | 11.5 | 12.0 | 11.9 | 11.3 | 89.0 |

NOTE: Average protein contents in this summary should not be compared to each other since they are not grown in the same years. Compare protein contents only to the check variety.